

WE CLAIM:

1. A casing for a turbofan engine, the engine including at least a fan assembly, a compressor assembly, a combustor assembly and a turbine assembly, the casing comprising:  
a fan case portion;  
an intermediate case portion; and  
a gas generator case portion,  
wherein the fan case portion, the intermediate case portion and the gas generator case portion are integrally joined together, thereby forming an integral casing.
2. The casing as claimed in claim 1 wherein the fan case portion, the intermediate case portion and the gas generator case portion are made of the same material.
3. The casing as claimed in claim 1 wherein the intermediate case portion further comprises an integral compressor shroud portion and an integral bearing mount portion.
4. The casing as claimed in claim 3 wherein the bearing mount portion is configured to provide integral damping to a shaft bearing.
5. The casing as claimed in claim 1 wherein the individual fan case portion, the intermediate case portion and the gas generator case portion are fabricated individually and welded together.

6. The casing as claimed in claim 1 wherein the fan case portion, the intermediate case portion and the gas generator case portion are joined together by flangeless connections.
7. A bypass turbofan engine comprising:  
at least a fan, a compressor, and a gas generator disposed in flow series within the engine, and a bypass airflow defined around at least the compressor and gas generator; and  
a one-piece casing substantially encasing the fan, compressor and gas generator.
8. A turbofan engine as claimed in claim 7 wherein the casing further comprises an integral compressor shroud encircling blade tips of the compressor.
9. A turbofan engine as claimed in claim 8 wherein the casing further comprises an integral bearing seat for directly mounting a compressor shaft bearing to the casing.
10. A turbofan engine as claimed in claim 9 wherein bearing seat is configured to provide integral damping to the compressor shaft bearing.
11. The turbofan engine as claimed in claim 7 wherein the casing at least partially defines a by-pass air flow passage within the engine.
12. A turbofan engine for an aircraft comprising:

- a rotating assembly including a propulsive fan portion, a compressor portion, and a gas generator portion, the rotating assembly having an axial length; and
  - a generally tubular casing assembly enveloping the rotating assembly substantially along the axial length thereof and thereby defining a main flow path through the engine, wherein the casing assembly is an integrated single piece.
13. The turbofan engine for aircraft as claimed in claim 12 wherein the casing assembly further comprises a integral shroud section encircling a plurality of compressor blade tips of the compressor portion.
14. The turbofan engine for aircraft as claimed in claim 12 wherein the casing assembly further comprises a integral bearing seat for operatively supporting a compressor shaft of the compressor portion.
15. The turbofan engine for aircraft as claimed in claim 12 wherein the casing defines at least a portion of a by-pass air duct of the engine.
16. A method of reducing the weight of a turbofan engine having a casing assembly, the method comprising a step of providing a one-piece integral case to surround the turbofan engine and an associated bypass flow.
17. The method of claims 16 further comprising a step of integrating an intermediate case portion, a fan case portion, and a gas generator case portion with flangeless connections.

18. The method as claimed in claim 16 comprising a further step of integrating a compressor shaft bearing support with the case.
19. The method as claimed in claim 16 comprising a further step of integrating a compressor shroud with the case.
20. A method of assembling a gas turbofan engine for aircraft comprising:  
  
providing a gas turbofan engine casing assembly including a fan case, an intermediate case and a gas generator case;  
  
placing a propulsive fan assembly, a compressor assembly, and a gas generator assembly into the casing assembly; and  
  
completing the assembly of the engine by mounting other components to the casing assembly.
21. The method as claimed in claim 20 further comprising:  
  
providing the respective fan case, intermediate case and gas generator case; and  
  
assembling the casing by integrating the fan case, intermediate case and gas generator case together using flangeless connections prior to placing the propulsive fan assembly, the compressor assembly and the gas generator assembly thereinto.
22. The method as claimed in claim 21 wherein the intermediate case comprises a compressor shroud and a section of a fan air bypass flow duct.

23. The method as claimed in claim 20 further comprising a step of machining an interior surface of the integrated casing assembly to reduce any tolerance stack-up in the casing assembly.